

**DETECTION AND DISCRIMINATION OF
INSTABILITIES IN PROCESS CONTROL LOOPS**

ABSTRACT

5 A method and apparatus determines the presence of and source of instabilities,
such as limit cycles, within a process control loop while the process control loop
operates on-line within a process environment. The method and apparatus measures
one or more signals within a process control loop when the process control loop is
connected on-line within a process control environment, stores the measured signal as
signal data and then performs one or more statistical analyses on the stored signal data
10 to determine whether instabilities exist and, if so, whether the source of an instability
is within a servo loop or outside of a servo loop and is due to friction, external forces
or mechanical anomalies.